DOCUMENT RESUME

ED 253 764 CE 040 816

AUTHOR Little, Ralph
TITLE Construction Cluster Brief. Vocational Education in Oregon.
INSTITUTION Oregon State Dept. of Education, Salem.
PUB DATE Nov 84
NOTE 9p.; For related documents, see CE 040 810-820.
PUB TYPE Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Articulation (Education); Behavioral Objectives; *Building Trades; Construction Industry; *Course Content; Course Organization; *Criteria; Curriculum Development; *Educational Objectives; Educational Planning; Occupational Clusters; Program Descriptions; *Program Development; Program Improvement; Secondary Education; State Curriculum Guides; State Programs; *Statewide Planning; Trade and Industrial Education; Vocational Education
IDENTIFIERS *Oregon

ABSTRACT

This guide sets forth minimum approval criteria for construction occupations education programs in Oregon. The key occupations in the construction cluster are: carpenter, trowel trades, floor coverings, roofer, painter, and pipe trades. The information in the guide is intended for use by district-level curriculum planners, teachers, regional coordinators, or state education department staff involved with new program development or revisions of existing programs. The guide outlines the instructional content of construction trades programs in terms of program descriptions, areas for training, program goals, course/content goals, and sample performance objectives. Course titles and descriptions are also included. A section on organizational options is designed to illustrate a few of the many ways to deliver the minimum instructional content required for an approved vocational cluster program. Content is illustrated by course titles for the instructional levels to recognize that students from different grades may enroll in one or more levels of a program. (KC)

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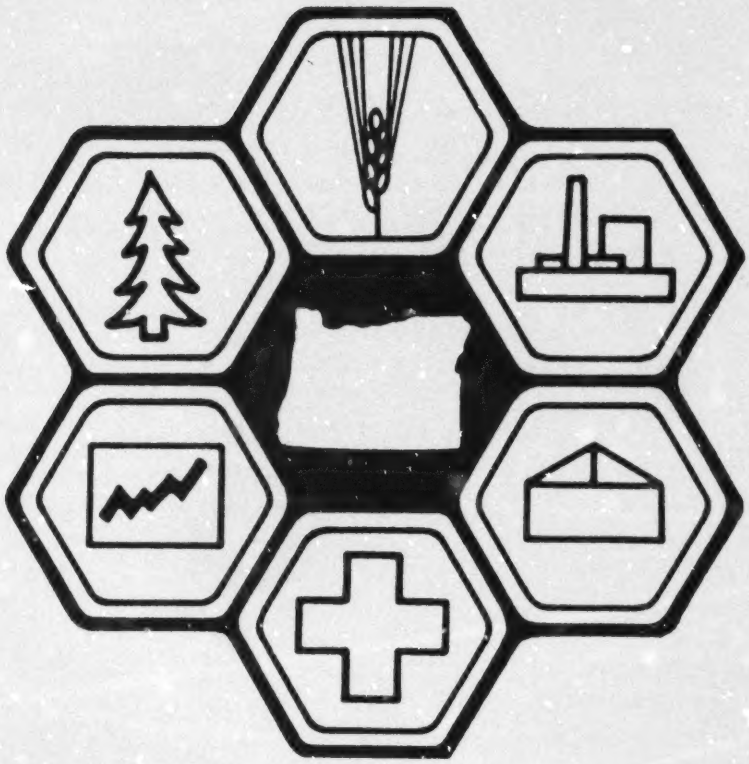
CLUSTER BRIEF

CONSTRUCTION

November 1984



Vocational Education in Oregon

CG040816

OREGON DEPARTMENT OF EDUCATION
700 Pringle Parkway SE
Salem, OR 97310

Ralph Little
(Specialist's Name)

378-8376
(Specialist's Phone Number)

CONSTRUCTION VOCATIONAL CLUSTER PROGRAM
MINIMUM APPROVAL CRITERIA

The following information is for use by district-level curriculum planners, teachers, regional coordinators or Department staff involved with new program development or revisions of existing programs. For more information about instructional content, see Curriculum Guide for Construction.

The minimum approval criteria for a Construction Cluster program are set forth in this document. The instructional content is outlined in terms of program descriptions, areas for training, program goals, course/content goals and sample performance objectives. Course titles and descriptions are also included.

The section on organizational options is designed to illustrate a few of the many ways to deliver the minimum instructional content required for an approved vocational cluster program. Please note that time is illustrated in terms of credits. Content is illustrated by course titles for the instructional level(s) to recognize that students from different grades may enroll in one or more levels of a program.

Program Description

The Construction cluster groups occupations by tasks pertaining to the construction of commercial, industrial, residential and public works projects utilizing a variety of materials such as wood, metal, concrete and plastics.

Areas for Training

The key occupations in the construction cluster are:

Carpenter
Trowel trades
Floor coverings
Roofer
Painter
Pipe trades

The following program and course goals were derived from a comprehensive skill or task inventory that was reviewed and adopted by an industry-based panel in the fall of 1982. The goals were also adopted by a panel of construction instructors as a reasonable base for a two-year construction program. Tasks are oriented toward residential construction since such projects are more easily utilized in a high school program. However, an awareness of commercial and public works construction jobs should be incorporated into the instruction program as much as possible. Most of the included skills and tasks can be transferred between various types and levels of construction jobs.

While various instructional delivery systems may be utilized by school districts, course goals submitted to the Department of Education for approval must reflect all the items on the Task or Skill Inventory and be written in terms of student outcomes.

Program Goals

Students will be able to:

- Work safely in a construction environment.
- Select, use and maintain tools and equipment of the construction trades.
- Communicate through the written, spoken, and symbolic language of the construction industry.
- Perform mathematical calculations that are commonly used by construction workers.
- Select appropriate construction materials and utilize correct construction methods and techniques.
- Apply appropriate human relations skills in a work setting.
- Identify a variety of career options and career ladders including entrepreneurship available within the construction trades.
- Apply basic scientific data and principles common to construction occupations.

Course/Content Goals

The student will be able to:

Select appropriate protective clothing and equipment for each task.

Lift and carry materials and equipment in a proper manner.

Use electric power tools safely.

Use pneumatic tools safely.

Use ladders safely.

Design and build scaffolding according to code specifications.

Select appropriate eye protective equipment.

Apply appropriate safety precautions relating to dusts, fumes and gasses.

Select appropriate ear protective equipment.

Use proper methods for handling and storage of materials.

Use hand tools safely.

Maintain good housekeeping in the work area.

Apply proper first aid and CPR techniques.

The student will be able to:

Select tools, equipment and materials appropriate to the job to be performed.

Demonstrate correct and safe usage of tools and equipment in performance of a job.

Maintain tools and equipment used at a construction site.

The student will be able to:

Read and interpret blueprints, drawings and specifications.

Use terminology of construction trades.

Use sketching for communication.

Use oral communication with meaning and clarity.

Prepare work orders, work schedules and other written communications of construction trades.

The student will be able to:

Add, subtract, multiply and divide whole numbers to solve practical problems of construction.

Calculate by decimals, fractions, percentages and ratio and proportion.

Calculate areas of rectangles, circles and volumes.

Use basic geometric principles in construction.

The student will be able to:

Do pre-construction planning and site preparation.

Lay out a building.

Use brick, stone and concrete in construction.

Reinforce with steel.

Frame a building.

Apply roofing materials.

Apply exterior siding and trim.

Determine type and placement of plumbing fixtures.

Determine type and placement of electrical fixtures.

Install insulation materials.

Install dry wall materials.

Install doors and windows.

Apply exterior and interior paints and paper.

Install floor coverings.

Use materials and techniques for energy efficiency in construction.

The student will be able to:

Work cooperatively with fellow employees, employers and customers.

Show a positive work attitude.

Accept leadership responsibilities at work site.

The student will be able to:

Identify jobs and working conditions for each of the key occupations in the construction cluster.

Define requirements and routings for entry into each of the key occupations.

Describe the career ladders for advancement within each of the key occupations.

Use appropriate job search techniques.

Describe entrepreneurship opportunities in construction.

The student will be able to:

Identify basic properties of soil.

Explain significance of erosion, water table, percolation tests.

Identify mechanical factors as applied to basic properties of construction materials; heat and sound transfer/insulation; and hoisting and rigging.

Identify basic chemical components and principles applicable to common construction materials such as plastics, paints, thinners, solvents, roofing materials, insulation, etc.

Sample Performance Objectives

Given a representative list of tasks and working conditions typical to various construction sites the student will determine the proper protective clothing and equipment to be used in each task.

Given the proper materials, conditions, and information the student will write the specifications for the construction of a single family residence using the most recent Uniform Building Codes standards and material specifications forms.

Given the proper information, drawings, and specifications and using a standard printed form the student will calculate the labor and material costs for a single family residential structure.

Given the proper tools and equipment the student will level the surface of a concrete slab by floating and troweling the surface to a smooth, dense surface.

Given the proper information the student will demonstrate knowledge of apprenticeship requirements, application procedures, and contact person in his/her area for three construction occupations.

Course Titles and Descriptions

Construction I: This is the first level of instruction in the vocational construction cluster program. Instruction is offered on a basic level in all six of the key occupations: carpenter, roofer, painter, floor coverings, pipe trades, and trowel trades. Students learn the basic building materials,

basic tool and equipment use, and basic technology relating to the construction industry. The communication skills, math and science skills associated with the construction occupations are incorporated into the instructional program.

Construction II: This course provides students opportunity to build on the information base and skill base that they developed in Construction I. More complex building technologies are utilized in the instruction program. Time is provided for more skill development in the use of equipment, the acquisition of knowledge and the economics relating to the industry. Students are also provided opportunity to participate in work experience activities as they are available. The communication, math, and science skills associated with the construction occupations are incorporated into the instructional program.

* *

Minimum Construction Vocational Cluster Approval Criteria

In addition to specific cluster criteria, state-approved vocational programs shall meet the criteria for approval of all secondary vocational education instruction as listed in the Handbook of Policies and Procedures for Vocational Education Instruction in Oregon Secondary Schools, 1985.

Criteria outline:

- 4 credits (130 hours per credit) offered:
  - 2 credits each of two years or 4 credits in one year.
- Instructional time blocks of sufficient duration for skill development to meet industry standards.
- Program goals, course goals and instructional content which reflect those in the state cluster brief.
- Provision for occupational cooperative work experience. If offered, it must be in addition to the 4-credit basic instructional program.
- Vocationally certified teacher.
- An active, representative occupational advisory committee.
- Vocational Industrial Clubs of America (VICA) as an integral part of the instructional program.

* *

Organizational Options

There are many acceptable options for delivery of instructional content while assuring that a quality program is provided. Schools have the opportunity to schedule classroom and laboratory activities to accommodate students and to facilitate learning. Delivery options include after school, weekends, summer school or alternate days.

Option	A	B	C
	1-Year Program	1-Year Program	3-Year Program
Level I			Basic Construction 1 Credit
Level II		Construction I 2 Credits	Construction I 2 Credits
Level III	Construction I-II 4 Credits	Construction II 2 Credits	Construction II 2 Credits

Option D

1 to 3 year program

flexible time
flexible credit

For Option D, 75 percent of enrolled students must pass appropriate student occupational competency achievement test at completion of program with a score equal to or better than national norm. Tests are developed by the National Occupational Competency Testing Institute (NOCTI). Contact NOCTI liaison person at Oregon Department of Education, 378-8376.

If you need technical assistance, call the Occupational Program Specialist at the Department of Education. The specialist's name and phone number appear on the first page of this document.

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